

Amendment to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1-12. (cancelled)

13. (previously presented) A method for determining residence times of motile specimens on a force transducing sensor comprising the steps of:

introducing a multiplicity of motile specimens in a medium into a motion sensor system comprising:

an enclosed chamber adapted to receive a multiplicity of motile specimens;

at least one force transducing sensor positioned within the chamber so as to be immersed in the medium during operation;

force transducing sensor surface coatings having characteristics appropriate for the motile specimens; and

a motion detector for detecting motion of the force transducing sensor caused by the motion of the motile specimens;

measuring the motion of the force transducing sensor caused by the motion of the specimens, said measuring including the steps of:

directing a sensing beam through a transparent substrate toward the force transducing sensor using a beam generator mounted on the transparent substrate; and

receiving a reflected beam through the transparent substrate from the force transducing sensor using a beam detector mounted on the transparent substrate; and

calculating the residence times of the motile specimens on the force transducing sensor surface coatings from the motion of the force transducing sensor, wherein an interaction of the motile specimens with the force transducing sensor as a result of the motion of the motile specimens is categorized as one of an impact, an oscillation, and a retention to facilitate identifying a binding behavior of the motile specimens.

14. (previously presented) The method of claim 13 wherein the motile specimens are part of a biological sample.

15. (previously presented) The method of claim 13 wherein the force transducing sensor surface coatings are biologically active surface coatings.

16. (previously presented) The method of claim 13 wherein the force transducing sensor is a MEMS device.

17. (previously presented) The method of claim 16 wherein the MEMS device is a cantilever.

18. (previously presented) The method of claim 17 wherein the MEMS device includes at least two cantilevers.

19. (previously presented) The method of claim 18 wherein one cantilever is a reference cantilever with a biologically inactive surface coating.

20. (cancelled)

21. (currently amended) A method for ~~determining characteristic motile frequency of motile specimens on a force transducing sensor comprising the steps of~~ detecting motion of motile specimens within a medium, said method comprising:

introducing into an enclosed chamber a medium having therein a multiplicity of motile specimens moving within the medium with a motile frequency;

disposing at least one force transducing sensor within the chamber so as to be immersed in the medium during analysis and to interact dynamically with the motile specimens;

directing the motile specimens at the at least one force transducing sensor;

~~sensing motion of the at least one force transducing sensor~~ a dynamic interaction of the motile specimens with the at least one force transducing sensor by directing a beam through a transparent substrate toward the at least one force transducing sensor using a beam generator mounted on the transparent substrate and detecting a reflected beam through the transparent substrate from the at least one force transducing sensor using a detector mounted on the transparent substrate, the transparent substrate forming a wall of the chamber; and

determining the characteristic motile frequency of the motile specimens by detecting the dynamic interaction of the motile specimens with the at least one force transducing sensor via changes in a signal detected by the detector to facilitate measuring a concentration of the motile specimens in the medium.

22. (previously presented) The method of claim 21 wherein the motile specimens are biologically motile.

23. (previously presented) The method of claim 22 wherein the motile specimens are sperm.

24. (previously presented) The method of claim 21 wherein the force transducing sensor is a MEMS device.

25. (previously presented) The method of claim 24 wherein the MEMS device is a cantilever.

26. (currently amended) A method for determining characteristics of a motile specimen under analysis comprising the steps of:

positioning at least one force transducing sensor within a chamber adapted to receive the motile specimen under analysis;

directing motile specimens in a fluid toward ~~[[the]]~~ a surface of the at least one force transducing sensor at an angle substantially orthogonal to the surface;

causing an interaction ~~between~~ of the motile specimens ~~[[and]]~~ with a coating on the surface capable of interacting with the motile specimens;

allowing ~~[[said]]~~ the motile specimens to interact with the force transducing sensor; and

detecting a measureable characteristic of the motile specimens in accordance with the interaction with the force transducing sensor using a beam directed through a transparent substrate toward the at least one force transducing sensor and a beam reflected by the at least one force transducing sensor through the transparent substrate, the transparent substrate forming a wall of the chamber, wherein the interaction of the motile specimens with the force transducing sensor as a result of the motion of the motile specimens is categorized as one of an impact, an oscillation, and a retention to facilitate identifying a binding behavior of the motile specimens.

27-32. (cancelled)